

DEVELOPMENT OF SOLID WASTE MANAGEMENT PLAN IN KUALA NERUS,
TERENGGANU

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ABSTRACT

Solid Waste disposal and wrong management is both an urban and rural problem. Every person is a potential generator of waste and thus a contributor to this problem. The generation of waste is one thing and the amount of waste generation is another thing. The management and disposal of waste depends on the type of waste generation and it is quite a different issue. Before this, Kuala Nerus was in the district of Kuala Terengganu but after the rapid growth of population and the highest urbanization in that area, Kuala Nerus is declared as a new district in Terengganu. This means that Kuala Nerus will have its own management centre and does not need to rely on management of Kuala Terengganu anymore. This study was carried out in Kuala Nerus Town which is the new district in the state of Terengganu, Malaysia. The main objective of this study was to estimate the type and amount of solid waste generation in Kuala Nerus, Terengganu. The other objective was to make recommendation or suggestion for future action to establish environmentally sound management of solid waste. This study used a combination of both quantitative and qualitative methodologies to research. So, I chose to use document review, observation and interview as the data collection method. The findings revealed that there are a few types of solid waste generated among the community in that area. There are four types of solid waste generated in this area which are paper, plastics, glass and metal. The result obtain shows that the amount of paper generated is 12kg/day while the amount of plastics generated is 10kg/day. Beside that, the amount of metal generated is 13kg/day while the amount of glass generated is 15kg/day. It is also identified that the amount of solid waste generated among the community increases from year to year. From the research, it show that most of the community practice "pit-burning" and also illegal dumping as their method of solid waste disposal. It is observed that people dumped waste along the paths, by the roadsides, in incomplete building structure, in bushes and in bare plots of land without any structures. This study revealed that the majority proportion of public in Kuala Nerus exhibited concern on amount of solid waste generation but sorting of solid waste is less adopted. Therefore, because of the increasing amount of solid waste generated and the low level of public participation in solid waste management in Kuala Nerus, some recommendations have been suggested. The best way to start dealing with the problem is for the Town Council authorities to show the people that they are worth by involving them in the initial planning process.

ABSTRAK

Pelupusan sisa pepejal dan pengurusan yang salah adalah masalah bandar dan luar bandar. Setiap orang adalah penjana potensi sisa dan dengan itu menjadi penyumbang kepada masalah ini. Penghasilan sisa adalah satu perkara dan jumlah penjanaan sisa adalah perkara lain. Pengurusan dan pelupusan sisa bergantung kepada jenis penjanaan sisa dan ianya merupakan isu yang agak berlainan. Sebelum ini, Kuala Nerus berada di dalam daerah Kuala Terengganu tetapi selepas pertumbuhan pesat, pertambahan populasi penduduk dan pembandaran yang paling tinggi di kawasan itu, Kuala Nerus diisytiharkan sebagai daerah baru di Terengganu. Ini bermakna Kuala Nerus akan mempunyai pusat pengurusan sendiri dan tidak perlu bergantung kepada pengurusan Kuala Terengganu lagi. Kajian ini telah dijalankan di kawasan daerah Kuala Nerus yang merupakan daerah baru di negeri Terengganu, Malaysia. Objektif utama kajian ini adalah untuk menganggar jenis dan jumlah penjanaan sisa pepejal di Kuala Nerus, Terengganu. Objektif lain adalah untuk member idea atau cadangan untuk tindakan masa depan untuk menubuhkan satu pengurusan alam sekitar sisa pepejal. Kuala Nerus merupakan daerah baru di Terengganu. Kajian ini menggunakan gabungan kedua-dua kaedah kuantitatif dan kualitatif untuk penyelidikan. Dapatan kajian menunjukkan bahawa terdapat beberapa jenis sisa pepejal yang dihasilkan di kalangan masyarakat di kawasan itu. Terdapat empat jenis sisa yang dihasilkan di kawasan ini iaitu kertas, plastic, kaca dan besi. Hasil kajian mendapati jumlah sisa kertas yang dihasilkan ialah 12kg/hari, manakala jumlah sisa plastic yang dihasilkan ialah 12kg/hari. Ia juga mengenal pasti bahawa jumlah sisa pepejal yang dihasilkan di kalangan masyarakat bertambah dari tahun ke tahun. Dapatan kajian mendapati majority masyarakat mengamalkan pembakaran terbuka dan lambakan haram sebagai cara penjanaan sisa mereka. Ia juga mendapati, masyarakat membuang sisa di sepanjang jalan, di tepi jalan, di kawasan bangunan yang belum siap didirikan, di dalam semak dan di kawasan lapang. Kajian ini mendedahkan bahawa sebahagian majoriti awam di Kuala Nerus mempamerkan kebimbangan dan sensitiviti mengenai sisa pepejal tetapi cara pengurusan sisa pepejal adalah kurang diterima pakai. Oleh itu, kerana tahap peningkatan jumlah sisa pepejal yang dihasilkan dan tahap penyertaan awam yang rendah dalam pengurusan sisa pepejal di Kuala Nerus, beberapa cadangan telah dikenalpasti. Cara terbaik untuk mula berurusan dengan masalah ini adalah pihak berkuasa iaitu Majlis Perbandaran Kuala Nerus harus menunjukkan kepada rakyat bahawa adalah penting pengurusan bahan pepejal ini dengan cara melibatkan mereka dalam proses perancangan awal.

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LIST OF ABBREVIATIONS

KNTC	Kuala Nerus Town Council
3R	Reduce, Reuse and Recycle
UNEP	United Nations Environment Program
MW	Municipal waste
SW	Solid Waste
SWM	Solid Waste Management
OED	Oxford English Dictionary
QT, QL	Quantitative and Qualitative
WDP	Waste Disposal Practices
MBKT	Majlis Bandaraya Kuala Terengganu
UMT	Universiti Malaysia Terengganu
UNISZA	Universiti Sultan Zainal Abidin
IPG	Institut Perguruan
MRSM	Maktab Rendah Sains Mara
UMP	Universiti Malaysia Pahang

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

Malaysia is faced with daunting challenges related to solid waste management. Due to an increase in population, economic growth, inadequate enforcement of waste legislation, infrastructure, and public attitude among others, solid waste management is considered a crucial issue in Malaysia, particularly in urban settings (Dawda Badgie, Mohd Armi Abu Samah, Latifah Abd Manaf, Azizi B. Muda, 2012). Solid waste disposal and wrong management is both an urban and rural problem. Every person is a potential generator of waste and thus a contributor to this problem. To generate waste is one thing, the type of waste generated is another and yet also the way the generated waste is managed or disposed of is quite a different issue. It has more often than not turned out that the rate at which solid waste is generated is far higher than the capacity to responsibly manage this waste. Waste is generated by and from different sectors which are domestic, commercial, industry and others and in many instances, the waste management responsibility has been left to the government or administrative authorities. There is growing consensus that the immediate stakeholders in the issue of solid waste (the generators of waste), in this case the residents need to join hands with the authorities in dealing with this problem that has far-reaching environmental and human health effects.

Kuala Nerus is one of the district in Terengganu that rank high in urbanization and urban population nowadays. As Kuala Nerus's urban areas increase in number and expand in geographical and population size, solid waste is swiftly emerging as a significant issue in environmental management.

Particularly, waste volumes have increased in urban area due to the growing urban population, concentration of industries, consumption of residents, and inadequate finance and facilities to manage waste and disposal. This district of affairs has led to the volume of solid waste generated to go beyond what the available facilities can accommodate.

One of the major factors that have contributed to poor waste collection and management in Kuala Nerus is limited community participation in solid waste management. The limited participation has budded from co-ordination and collaboration problems that exist among the three stakeholders in solid waste management are the communities, the public (government) and the private sectors (World Bank. 2012). This study seeks to explore public participation in solid waste management in Kuala Nerus. The current level of participation as well as whether and what, can be done to improve public participation in solid waste management are concerns addressed by this study.

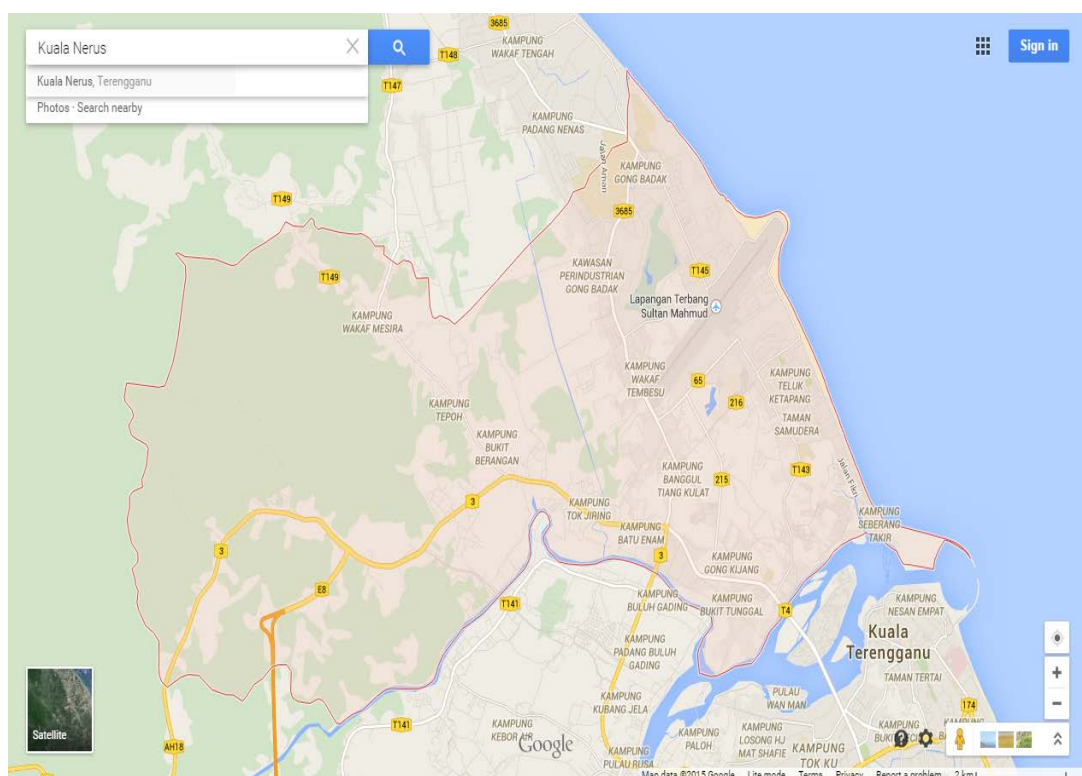


Figure 1.1 : Study area of the research

1.2 PROBLEM STATEMENT

Solid waste management may be not the major issue in the residential nowadays. But with the new development of town and country, it probably will increase time to time and it is also effect directly into environmental issues. Moving from straight disposal to waste management can reduce the risk of environmental issues.

Reduce, reuse and recycle (3R) solid waste may save money, improve the relationship between the public in the residential, also improve the relationship of the authority with the public instead of keep the beautiful environment from any pollution like air pollution, water pollution, odor pollution and so on (Hester, R.E. & Harrison, R.E. 2002). Beside that, it also can improve the awareness about the importance of solid waste management among the public. The challenges of involving the public in solid management plan in Kuala Nerus Town Council (KNTC) also will be considered during this research in order to improve the public participation in solid waste management in Kuala Nerus Town Council (Seow Ta Wee, Indera Syahrul Mat Radzuan & Jamaluddin Md Jahi. 2008).

1.2 OBJECTIVES OF STUDY

The objectives of the research are to :

- 1) To estimate the type and amount of solid waste generation in Kuala Nerus.
- 2) To make recommendations or suggestions for future action to establish environmentally sound management of solid waste.

1.3 SCOPE OF STUDY

- 1) This research will be conducted by interviewing the residents around Kuala Nerus.
- 2) This research will be conducted among the communities around the area of Kuala Nerus.
- 3) This study will be conducted within three months (September- December 2015)

1.4 SIGNIFICANCE OF STUDY

The study will serve a good application of waste management by giving the opportunity for student to conduct field research like how to manage the waste by different type of waste and to expose to the good participation of student in solid waste management.

CHAPTER 2

LITERATURE REVIEW

In this chapter, I present the literature review by introducing some key concepts and terminologies that are relevant to this thesis, then a review of the related literature. The review of related literature will presents a general literature related to solid waste management and public participation with particular inclination to the research questions.

2.1 INTRODUCTION, KEY CONCEPTS AND TERMINOLOGIES

In this section, a number of concepts and terminologies are explained. These include waste and a few types of waste, waste management and public participation.

2.1.1 WASTE

United Nations Environment Program (UNEP), 2010, defined wastes as substances or objects, which are disposed of or are intended to be disposed of or are required to be disposed of by the provisions of national law. Waste also refers to “an item, material or substance you as an individual consider useless at a given time and place”. Waste is a dynamic concept which can be defined in different ways. In most cases, the definition of waste depends on the type or category of waste under consideration. Some of the dominant types of waste include; municipal waste, solid waste, hazardous waste and, electronic waste. I will define municipal and solid waste, which are relevant to this study.

Municipal Waste (MW)

Dawda Badgie, Mohd Armi Abu Samah, Latifah Abd Manaf, Azizi B. Muda, 2012, take municipal waste to refer “to wastes from domestic, commercial, institutional, municipal and industrial sources, but excluding excreta, except when it is mixed with solid waste”.

It is however necessary to note that in developing countries, many a times it becomes difficult or even impractical to put a line between excreta and solid waste. In many instances, solid waste mixes with excreta to the extent of being potentially hazardous to human health.

Solid Waste (SW)

Solid waste, also known as garbage is not very different from municipal waste. This study takes on the definition by the State of the Environment Report for Malaysia that defines solid waste as “organic and inorganic waste materials produced by households, commercial, institutional and industrial activities that have lost value in the sight of the initial user”. I found it prudent to adopt a definition and meaning of solid waste that is in the context of the area of study.

2.1.2 SOLID WASTE MANAGEMENT (SWM)

Waste management refers to the “collection, transportation, processing, recycling or disposal of waste materials” (World Bank. 2012). It ought to be appreciated that waste management practices differ for developed and developing countries, for urban and rural areas, and for residential and industrial producers. The volumes and types of waste in these different sources of waste justify the difference in the waste management practices. It therefore implies that the methods appropriate in one setting may be incompatible within another setting. It is imperative to take into consideration the context of the waste source, to arrive at an appropriate method.

2.1.3 PUBLIC PARTICIPATION

According to the Oxford English Dictionary, OED, participation is “the action or fact of partaking, having or forming a part of”. Participation as a concept came to the lime light as a result of rising advocacy for the end of the top-down strategies to development action, in favour of greater inclusion of the subjects of the development programs. Seow Ta wee, 2009, agree that participation is a process and not just a solid product.

However, they are also quick to note that it is very difficult to establish a universal definition for participation. This indicates that different scholars, authors and organizations define and understand participation differently. Their definitions and understanding is often guided by the orientation and intent of the individual or organization defining participation, given the circumstances.

Although participation is widely known to be a free process, in some instances it practically requires that people are dragged into getting involved in operations that are of no interest to them, but they are coerced in the name of participation. Seow Ta Wee, 2009, look at participation as a concept that is closely linked to rural development. The conception that participation is an important ingredient in development presents a temptation to force participation at any cost. However, it is perhaps helpful to note that there is what Seow Ta wee, 2009, refer to as authentic participation, which is described as a result of a bottom-up process of development. The concept of participation requires clear interpretation and careful comprehension before it is adopted for any given purpose.

Seow Ta wee, 2010, try to explain the different interpretations of the concept of participation by use of four “terms”, that is; collaboration-input-sponsorship, community development, organization, and empowering. These terms are used to explain the different orientations in the participation discourse and the different terms represent different intentions or purposes for which participation is adopted by the implementers. Participation can be perceived as a means if it is adopted as a method of achieving success in a development program.

It can also be an end in itself if it is seen as “a process the outcome of which is meaningful participation”. In contemporary practice of participation, the former perception is more prominent. Participation is adopted as a catalyst to success of a beneficial undertaking in a community.

CHAPTER 3

RESEARCH METHODOLOGY

In this chapter, I present the methodology that I adopted for this study. The chapter describes a combination of quantitative and qualitative approaches to research, the research design, the data collection methods, sampling, data processing and analysis methods. My study area was located at Kuala Nerus, Terengganu. I have divided The area of Kuala Nerus into 10 sampling stations.

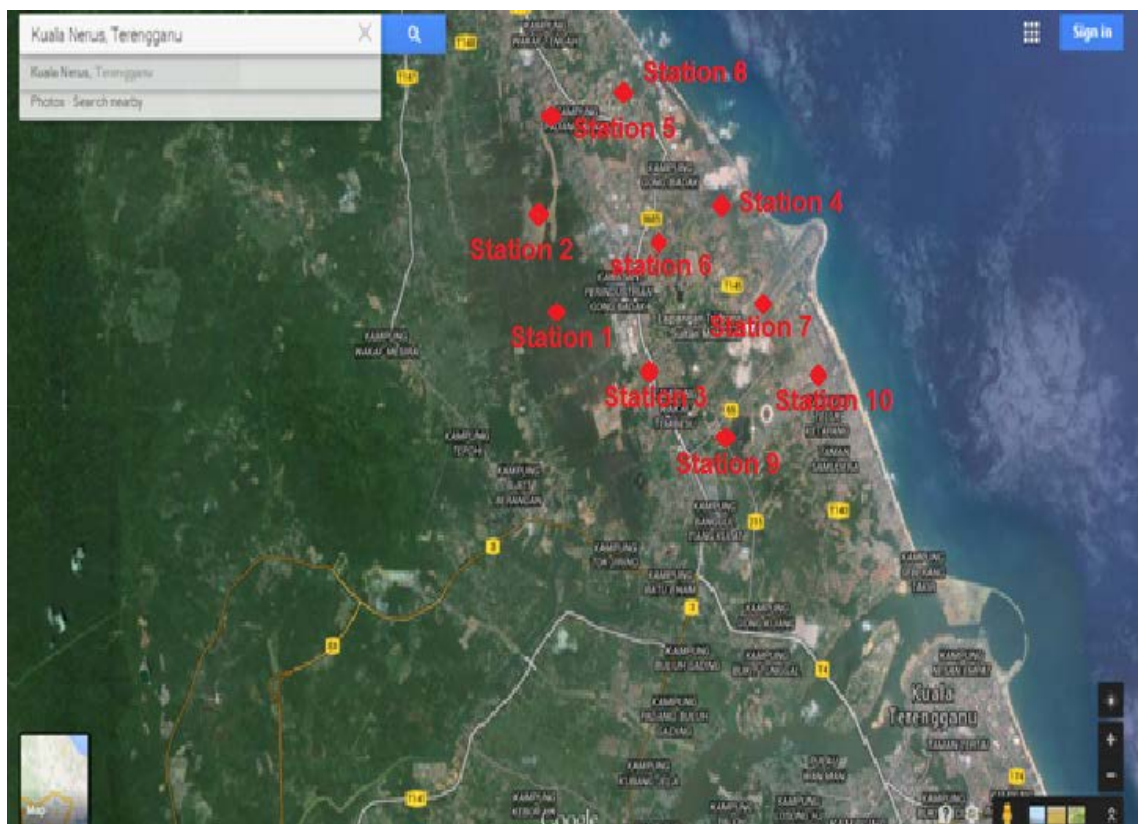


Figure 3.1 : Sampling stations in the study area

3.1 COMBINATION OF BOTH QUANTITATIVE (QT) AND QUALITATIVE (QL) APPROACHES

In this study I adopted a combination of both quantitative and qualitative methodologies to research. The objectives for this study (in chapter one) clearly show that the intention of this research was to explore the way the public engages in solid waste management, at what level and how the relationship between the local government and the public is with regard to solid waste management. Using a combined approach would therefore enable me to collect numerous forms of data and examine them from various angles to construct a rich and meaningful picture of a complex, multifaceted situation. The research questions were divided into two parts. On one hand, the first two research questions were addressed by use of quantitative techniques. On the other hand, the last two research questions necessitated the use of qualitative techniques. This decision was based on the conviction that for this study to yield meaningful conclusions, it had to draw on the advantages of using both qualitative and quantitative methods as explained below.

Quantitative

Quantitative research is applauded for the fact that the findings are generalisable and the data are objective. It was hoped that the findings from this study would help in reflecting what is happening in the whole of Kuala Nerus Town Council.

At the same time, it was important to have an amount of objectivity to dispel the concerns to the effect that qualitative research may be biased. Quantitative data and statistical analysis would also help in testing some hypotheses and increase on the validity of the findings from this study.

Qualitative

In this study, there was need for me to “dig deep” in order to get a complete understanding of the situation from the perspective of the stake holders in the solid waste management sector. Making statistical conclusions could not suffice in unveiling the picture of solid waste management in Kuala Nerus Town council from different perspectives. The perspective of the people could only be appreciated with the collection and analysis of qualitative data also. Qualitative research permits “understanding in context”. In this study, I tried to understand whether there was any kind of collaborative relationship between the public and the local administration (Town Council) in managing solid waste. The collaboration I was interested in was the public participation in solid waste management alongside the Town Council. Special focus was put on the challenges of involving the public in solid waste management. I was further interested in exploring whether there were any mechanisms put in place by Kuala Nerus Town Council to enhance collaboration in solid waste management with the public.

3.2 RESEARCH DESIGN

As already discussed above, I employed both quantitative and qualitative methodologies. This research essentially took on a descriptive survey design, seeking to “describe phenomena accurately” not only using quantitative data but also qualitative data. This research design aims at getting data from multiple cases at a given point in time so as to analyse relationships across a number of variables of interest.

This study was based on such a design because its quantification characteristic helps in consistent benchmarking (Bryman, 2004). However, cross-sectional studies usually lack internal validity (Bryman, 2004) and I tried to respond to this concern through the qualitative component of this study.

In this study therefore, the qualitative data was used to enrich the descriptions generated or from the quantitative data and thus build the picture of solid waste management in the study area, better. In doing so, aspects of a phenomenological study design to research were employed to guide qualitative data collection and analysis.

Since I was interested in finding out the beliefs and perceptions of the people regarding solid waste management, phenomenology was a paramount component to inform this research's study design. My epistemological stand was interpreted with inclination and intention to understand the way people "make sense of the world around them" and basing on that then I would also be able to understand the phenomenon. This allows the researcher to interpret the people's interpretations in light of the related concepts and literature. Ontologically therefore, knowledge would be constructed from the researcher's interpretation of the peoples interpretations.

3.3 DATA COLLECTION METHOD

The methods for data collection were dependent on the required data for each specific research question. However, generally considering that this study took on combination of both qualitative and quantitative methodology, I chose to use document review, observation and interview.

Depending on the kind of data that was required, I used the most appropriate data collection method to get the data from the different respondents. I therefore chose to use the different methods for different reasons.

3.3.1 Document Review

Document review is an unobtrusive data collection method which is non-reactive since documents cannot be influenced by the fact that they are being used. Organizations as well as government and in this case local government, produce many documents. These documents can potentially be used to acquire both quantitative and qualitative data. I requested for permission and consequently documents so I could derive relevant information from them. Although I hoped to readily find and access several documents like annual reports, survey reports, planning documents and other relevant documents. It had very revealing information about solid waste management in Kuala Nerus Town Council and the absence of other documents did not compromise the quality of the findings from this study to a worrying extent.

Some of the data from this document formed a precursor to the interviews with Town Council Officers. I felt that this would allow for more meaningful reflection and triangulation of issues from the documents in the interviews. This triangulation is usually necessary for purposes of examining information in documents, in light of other data sources, since documents may not be as objective as desired.

3.3.2 Observation

An observation is a very systematic and enables the researcher to generate numerical data from the observations. This being a study that is partly dependent on survey framework, it was hypothesised that the behaviour of the respondents would most likely be inferred, direct observation of people's behaviour with regard to their responses was therefore, done to check the accuracy of their responses. This observation was particularly used with the help of an observation schedule as a data collection tool. Residents, traders and market vendors were observed, to gather data for this study.

3.3.3 Interview

One of the reasons for adopting a combination of qualitative and quantitative research techniques in this study was because the research questions required different types of data. Face-to-face interview was used in place of a self-completion questionnaire. The reason for this choice is that I anticipated that the literacy levels of the potential respondents would vary. Not all the potential respondents were expected to possess the skill of reading, comprehending and writing. Because of this, it would not be easy to look for such respondents who possess those skills and therefore, a face-to-face structured interview was preferred also for standardization of both the asking of questions and the recording of answers.

Since the interview instrument was to be translated into the local language, it was deemed easier to ask the respondents face-to-face than leaving them to write the answers themselves. Interview method was used to collect data from residents, traders and market vendors.

3.4 SAMPLING

Data was collected by structured interview from 50 respondents. These comprised of residents, traders and market vendors from the Kuala Nerus Town Council, which were randomly selected. 30 interviews were also done with respondents who were purposively sampled considering their location and the information they were anticipated to possess. Other 20 interviews were conducted in each of the three randomly selected wards. Such a limited sample was used due to financial, time and manpower constraints.

The procedure of reaching the individual respondents to make up the sample for this study was based on convenience sampling. However, effort was made to have the sample drawn from a dispersed area, to avoid getting the sample from one place. Much as structured interviews were conducted, it was not deemed viable to choose the sample by random sampling.

This is because there was no established data base or list of all the residents, traders and market vendors in the Town Council thus making random sampling for individual respondents impossible.

Not all people who were contacted were willing to participate in the study by giving information that was required for the study. Some refuse, while others feared that they might not have the required information. Those who feared incompetence to give the required information were people who had either not gone to school or those who had not attained any qualification in education. They seemed to imagine that the information required was academic and thought that it required educational competencies. However, the reason could also have been that they had never participated in any kind of research study before so they did not have a picture of how to go about the answering of questions.

I therefore interviewed those respondents that were willing and had some time to spare to answer the interview questions. This also justifies the use of convenience sampling procedure which was adopted, but while keeping in mind the fact that the sample had to be got from a spread area.

3.5 DATA PROCESSING AND ANALYSIS

The quantitative data from the interviews, was coded and this data sheet prepared before the beginning of data collection. After the data had been collected, I went through the data pieces/ interviews at the end of each day of data collection. At the end of the data collection process and when all the codes had been entered into the data sheet, data analysis was done. Frequency tables were generated and cross tabulation was also made between relevant variables.

The data were then typed on the computer. Where after, emerging themes were identified and classification of the emerging themes done. The classification was continuously edited in light of the emerging data from interviews, so that the most relevant themes could be constructed. When the final classification of the themes had been constructed, discussion of the findings was done with regard to the literature review and the data from documents reviewed.